IN THE CLAIMS:

The listing of claims will replace all prior versions of claims in the application. Please note that the claim listing includes current amendments to claims 1-2, 4, 7-8, and 11 and the cancellation of claims 3, 5-6, and 9.

1. (*Currently Amended*)   A disk drive having a perpendicular magnetic recording system and a head that performs read and write operations in accordance with the perpendicular magnetic recording system, said disk drive comprising:

a disk medium including a magnetized area corresponding to data recorded with the perpendicular magnetic recording system and the head and a servo area in which servo data encoded with DC free code is recorded; and

a decoding unit configured to decode the servo data,

wherein the servo data is used for the position control of the head.

~~a disk medium in which a magnetized area corresponding to data recorded with said perpendicular magnetic recording system is formed in a perpendicular direction with respect to a medium surface; and~~

~~a head configured to conduct a read and write operation of the data with respect to said disk medium;~~

~~wherein said disk medium has a servo area in which servo data used for the position control of the head is recorded, and servo data coded with the DC free code is recorded on the servo area.~~

2. (*Currently Amended*)   The disk drive according to claim 1, further comprising~~;~~:

a read channel configured to conduct signal processing of a read signal read with said head from said servo area of said disk medium;

wherein said read channel extracts the read signal whose level changes depending upon the magnetization transfer position of said magnetized area and has a

predetermined low cut-off ~~low~~ frequency ~~characteristic~~ fc characteristic for eliminating low frequency component of the read signal, and

wherein the low cut-off frequency fc is predetermined by the relationship:

Tmin ≤ (-lnN)/2πfc

where Tmin is a minimum magnetization reverse interval time of said DC free coded servo data and N is a constant based on a read error rate of servo data.

3. (*Cancelled*)

4. (*Currently Amended*) A disk drive having a perpendicular magnetic recording system, a disk medium on which a magnetized area corresponding to data recorded on said perpendicular magnetic recording system is formed in a perpendicular direction with respect to a medium surface, and a head configured to perform read and write operation of the data with respect to said disk medium, said disk drive comprising:

~~a disk medium on which the magnetized area corresponding to data recorded on said perpendicular magnetic recording system is formed in a perpendicular direction with respect to a medium surface;~~

~~a head configured to conduct a read and write operation of the data with respect to said disk medium;~~

a read channel having a predetermined cut-off frequency ~~characteristic~~ characteristics fc that eliminates low frequency component of a read signal for extracting a read signal waveform whose level changes at a magnetization transfer position of the ~~magnetization~~ magnetized area from the read signal read with said head from said disk medium;

wherein said disk medium ~~has~~ includes a servo area in which servo data is recorded, said servo data being used to control position ~~which is used for the positioning control~~ of said head, ~~and~~ said recorded servo data ~~is recorded which comprises~~ comprising coded data in which the sum total of the length in the longitudinal direction of the area having a positive polarity of said magnetized area and

the sum total of the length in the longitudinal direction of the area having a negative polarity become equal to each other; and

wherein said read channel extracts the read signal whose level changes depending upon the magnetization transfer position of said magnetized area and has a predetermined cut-off frequency fc characteristics to eliminate low frequency component of a read signal which is predetermined by the relationship:

Tmin ≤ (-lnN)/2πfc,

where Tmin is minimum magnetization reverse interval time of said coded servo data on the servo area and N is a constant based on a read error rate of servo data.

5. (*Cancelled*)

6. (*Cancelled*)

7. (*Currently Amended*) A disk drive having a perpendicular magnetic recording system, a disk medium on which a magnetized area corresponding to data recorded on said perpendicular magnetic recording system is formed in a perpendicular direction with respect to the medium surface, and a head configured to perform read and write operations of the data with respect to said medium, said disk drive comprising:

~~a disk medium on which magnetized area corresponding to data recorded on said perpendicular magnetic recording system is formed in a perpendicular direction with respect to the medium surface;~~

~~a head configured to conduct a read and write operation of the data with respect to said medium; and~~

a read channel having a predetermined cut-off frequency ~~characteristic~~ characteristics fc for extracting a read signal waveform whose level changes at a magnetization transfer position of the magnetization area from the read signal read with said head from said disk medium;

wherein said disk medium has a servo area in which servo data is recorded, said servo data being used to control position ~~which is used for the positioning control~~ of said head, the recorded servo data comprising coded data in which the minimum magnetization reverse interval time Tmin of said magnetized area satisfies ~~a condition such as a relationship of Tmin ≤ (-lnN)/2 π fc, wherein N is a constant experimentally set on the basis of the read error rate.~~ the following condition:

Tmin ≤ (-lnN)/2πfc,

wherein fc is a predetermined cut-off frequency of said read channel for eliminating low frequency component of a read signal and N is a constant based on a read error rate of servo data.

8. (*Currently Amended*) The disk drive according to claim 7, wherein ~~on the servo area servo data is recorded which is used for the positioning control of the head,~~ the data comprising coded data ~~which satisfies a condition such as said relationship, wherein N is 0.5 or more.~~ satisfying said Tmin condition has the constant N set to 0.5 or more.

9. (*Cancelled*)

10. (*Original*) A method of recording coded servo data in a disk drive having a disk medium and a head, the method comprising:

encoding servo data used for the positioning control of the head with a DC free code; and

conducting perpendicular magnetic recording of the coded servo data on the disk medium.

11. (*Currently Amended*) A method of recording coded servo data in a disk drive having a disk medium, a head, and a read channel, the method comprising:

~~said read channel having a low area shield characteristic of a predetermined shield frequency for extracting a read signal waveform whose level changes at the magnetization transfer position of the magnetization region from the read signal read with the head from the disk medium;~~

~~wherein said read channel codes the servo data used in the positioning control of the head to coded data wherein the minimum magnetized reverse interval time Tmin of said magnetized area satisfies a condition such as a relationship of Tmin ≤ (-lnN)/(2 π fc) where N is a constant which is experimentally set on the basis of a read error rate;~~

providing the read channel with a predetermined cut-off frequency fc to eliminate low frequency component of a read signal;

configuring the read signal to extract a read signal waveform having levels that change at a magnetization transfer position located in a magnetization area of said disk medium;

encoding, via the read channel, the servo data used in the positioning control of the head to coded data in which the minimum magnetized area satisfies the condition of $Tmin \leq (-lnN)/2\pi fc$, wherein fc is a predetermined cut-off frequency of said read channel for eliminating low frequency component of a read signal and N is a constant based on a read error rate of servo data; and

~~said read channel conducts~~ performing, via the read channel, the perpendicular magnetic recording of the servo data in the servo area on the disk medium.